

Björn Peters



# SQL Server Installation Zutaten und Zubereitung

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## 13:45 Track 1

„Das super nerdige Solisyon Film- und Serienquiz“



# Save the date for exiting upcoming events

## PASS Camp 2017

Main Camp **05.12. – 07.12.2017** (04.12. Kick-Off abends)  
Lufthansa Training & Conference Center, Seeheim

## SQL Konferenz 2018

PreCon: **26.02.2018**  
MainCon: **27.02. – 28.02.2018**  
Darmstadtium, Darmstadt

More information at PASS booth



# About Me



## Björn Peters

SQL Server Lead DBA  
Atos Information Technologies GmbH  
PASS Deutschland e.V. Member, Volunteer, Speaker  
Azure Meetup Hamburg Leader  
Father, Husband, Snowboarder, Cyclist, Geek  
Cloud & Datacenter MVP



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[@SQL\\_auS\\_HH](https://twitter.com/SQL_auS_HH)



[SQL\\_auS\\_HH](https://www.instagram.com/SQL_auS_HH)



# Agenda

- Hardware-Aspekte
- Vorbereiten der Installation
- Next, Next, Next... Finish
- Konfiguration des Servers
- Nachbereitung der Installation
- Q&A



# Welches Rezept soll umgesetzt werden?



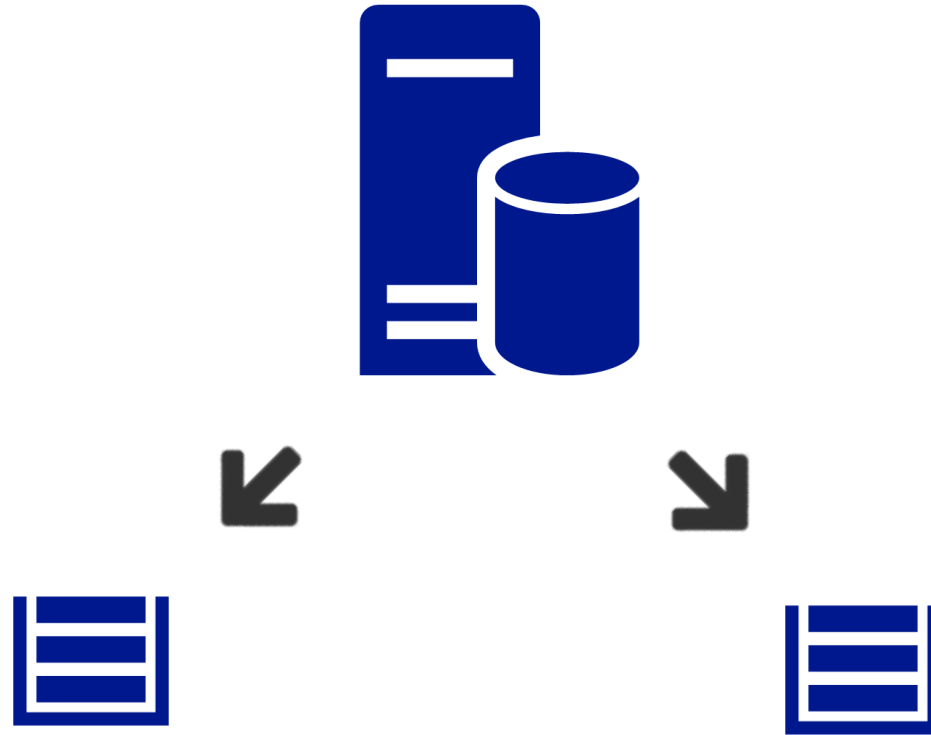
# Fastfood is not always good

## 1. Festplatte C

OS, MS SQL Installation

## 2. Festplatte D

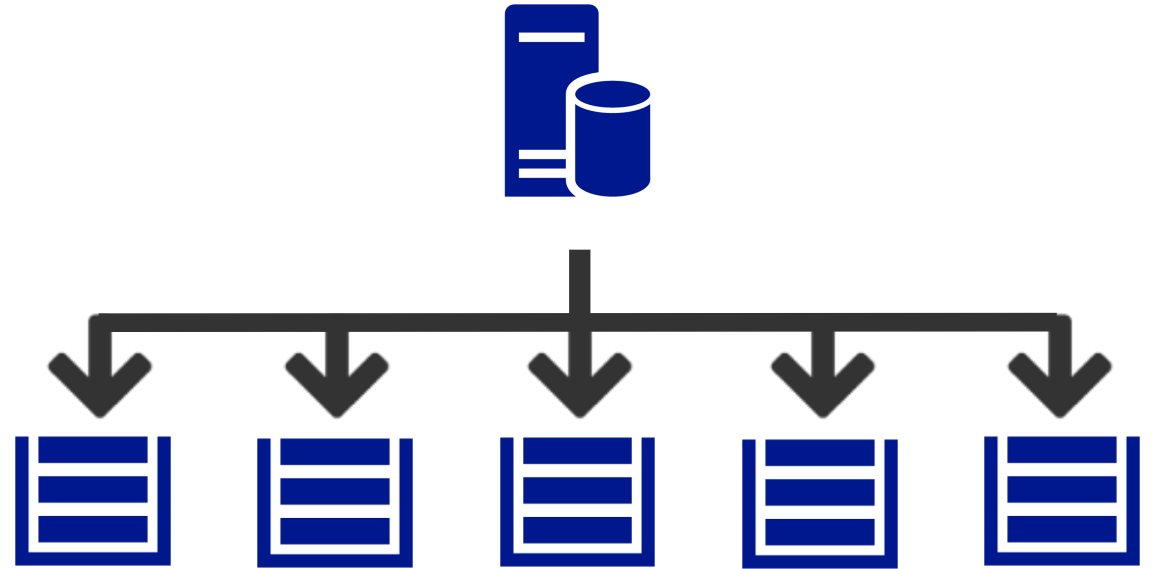
Data, Log, TempDB, Applikation





# 5-Sterne-Deluxe Menü

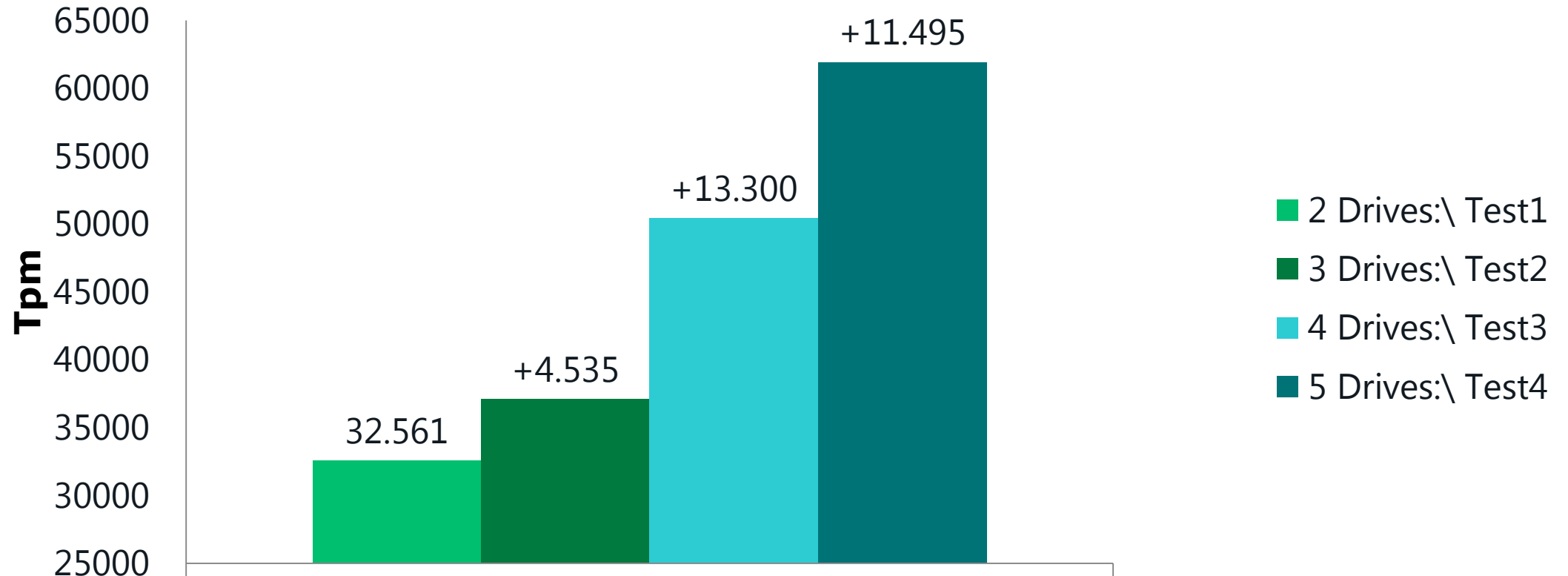
1. Festplatte C  
OS
2. Festplatte  
MS SQL Installation
3. Festplatte  
Datafiles
4. Festplatte  
Transaction-Logfiles
5. Festplatte  
TempDB-Datafiles



6. Festplatte  
InMemory / Bufferpool
7. Festplatte  
Backup



# Versuch / Erkenntnis





# Das Schnibbeln

# Vorbereitung der Zubereitung

Disc-Alignment / Disc-Configuration

Disk 1 66 GB OS

Disk 2 SQL Engine 10GB mit **4K** Format

2.1 Data 300GB mit **64K** Format

2.2 TLOG 100GB mit **64K** Format

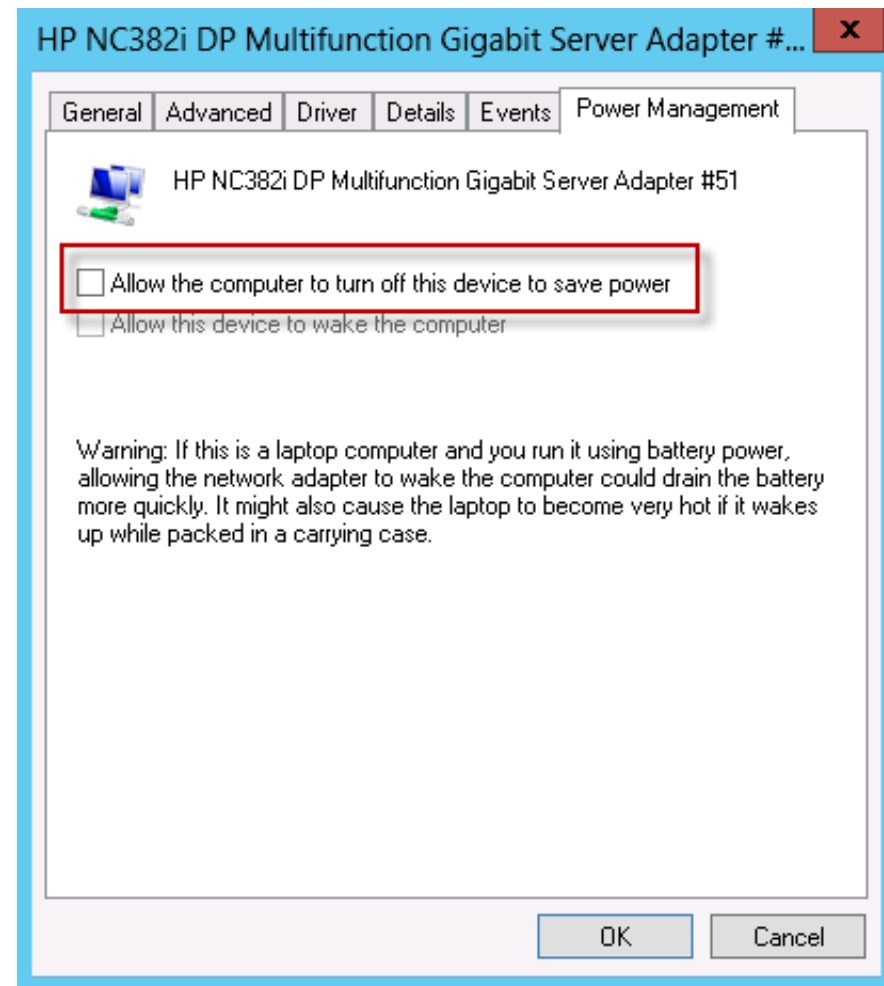
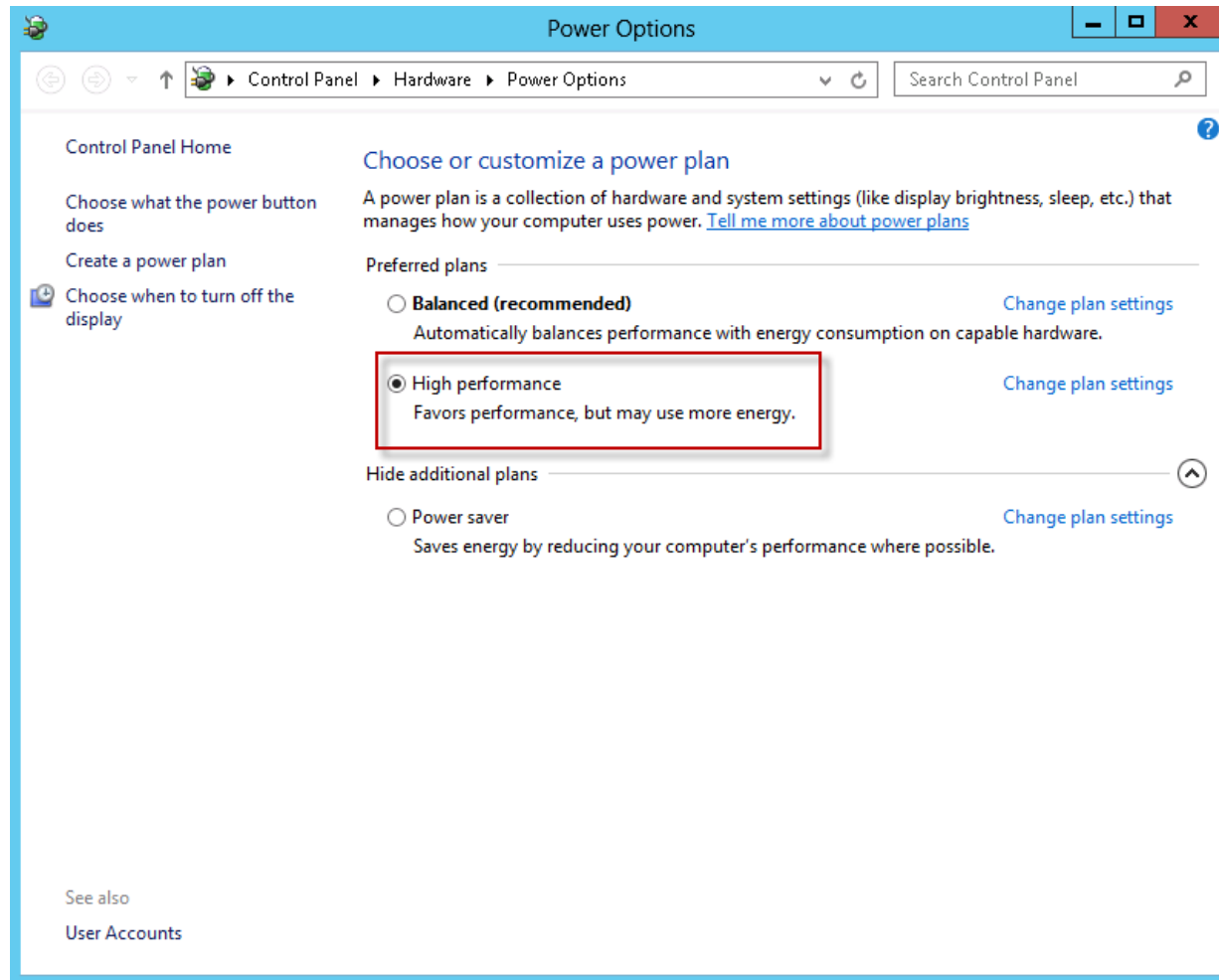
2.3 TempDB 100GB mit **64K** Format

***"fsutil fsinfo ntfsinfo <drive>:"***



# Vorbereitung der Zubereitung

## Power Options Configuration



# Vorbereitung der Zubereitung

## Local User Rights

- Back up files and directories

To avoid problems during adding, removing, listing folders and copying Data, Files

[http://www.sql-aus-hamburg.de/go/Backup\\_files\\_and\\_directories](http://www.sql-aus-hamburg.de/go/Backup_files_and_directories)

- Debug programs

Determines which users can attach a debugger to any process. This privilege provides powerful access to sensitive and critical operating system components.

[http://www.sql-aus-hamburg.de/go/Debug\\_programs](http://www.sql-aus-hamburg.de/go/Debug_programs)

- Manage auditing and security log

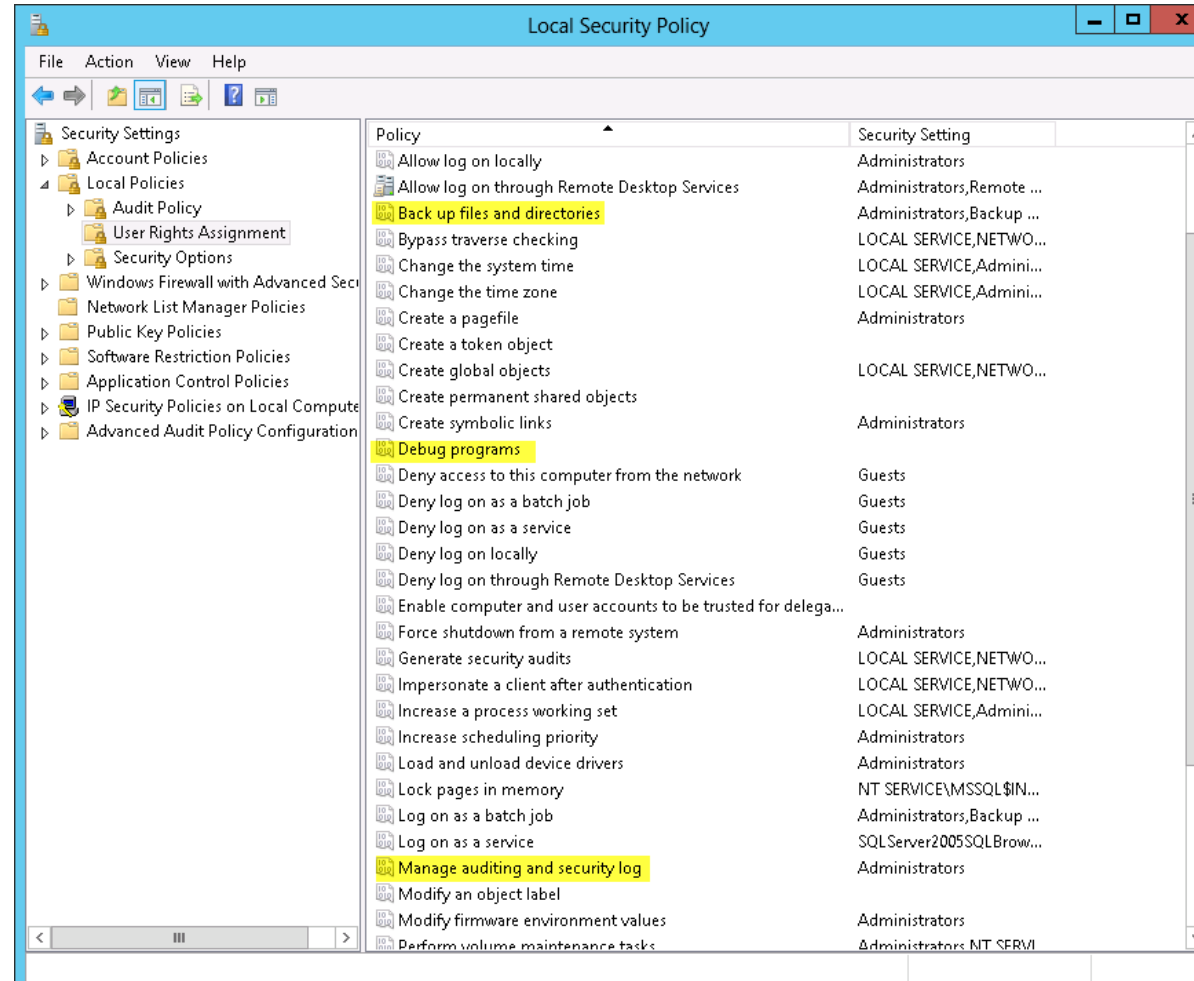
To avoid problems during adding, removing, listing folders and copying Data, Files

[http://www.sql-aus-hamburg.de/go/Manage\\_auditing\\_and\\_security\\_log](http://www.sql-aus-hamburg.de/go/Manage_auditing_and_security_log)



# Vorbereitung der Zubereitung

## Local User Rights



# Vorbereitung der Zubereitung

Frameworks / Patches / Fixes

- Frameworks (.NET 3.5 / 4.x)
- Letztes OS - ServicePack
- Letztes OS - Cumulative Update
- Download aller notwendigen SQL ServicePacks und Cumulative Updates

<http://www.sql-aus-hamburg.de/go/sqlserverbuilds/>







# Zusammenrühren

# erst die trockenen Zutaten

- alle notwendigen Informationen bereitlegen

Instanznamen

Collation

Service- / AdminUser

Pfade

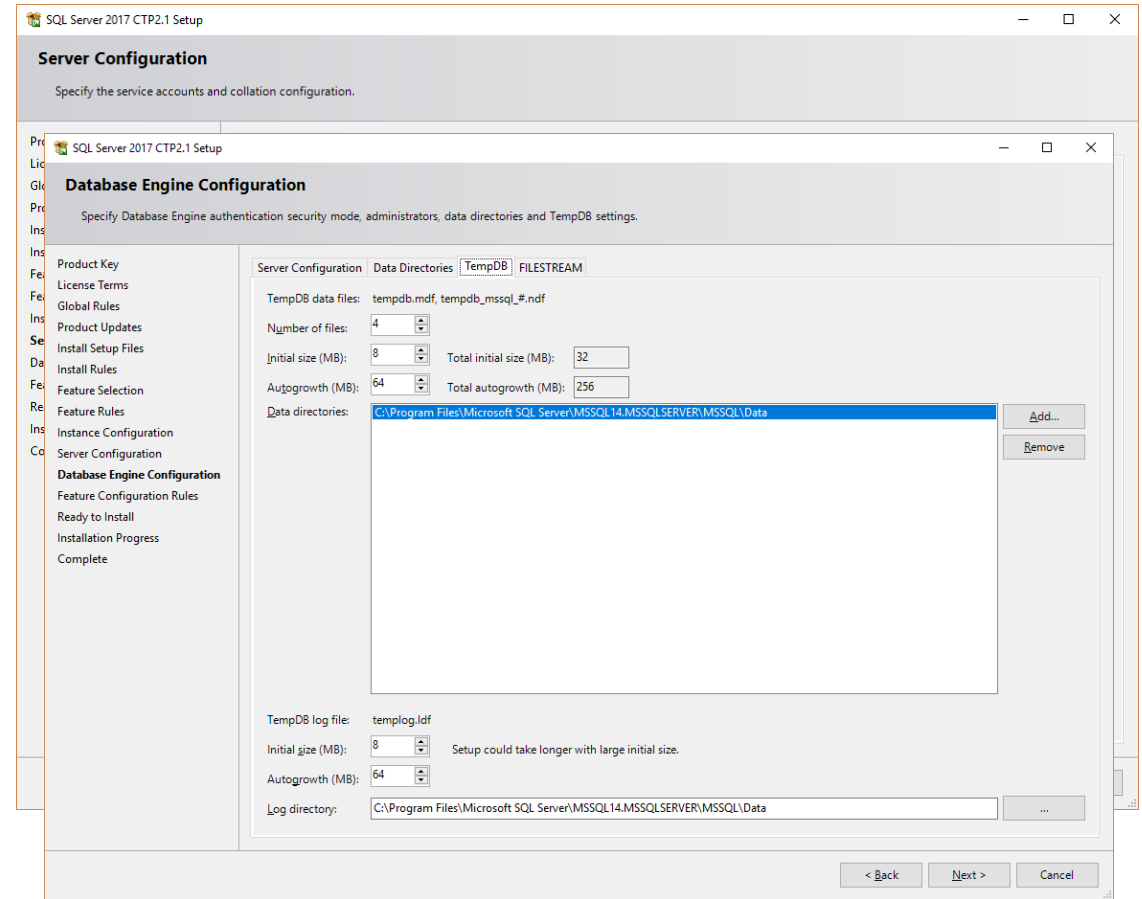
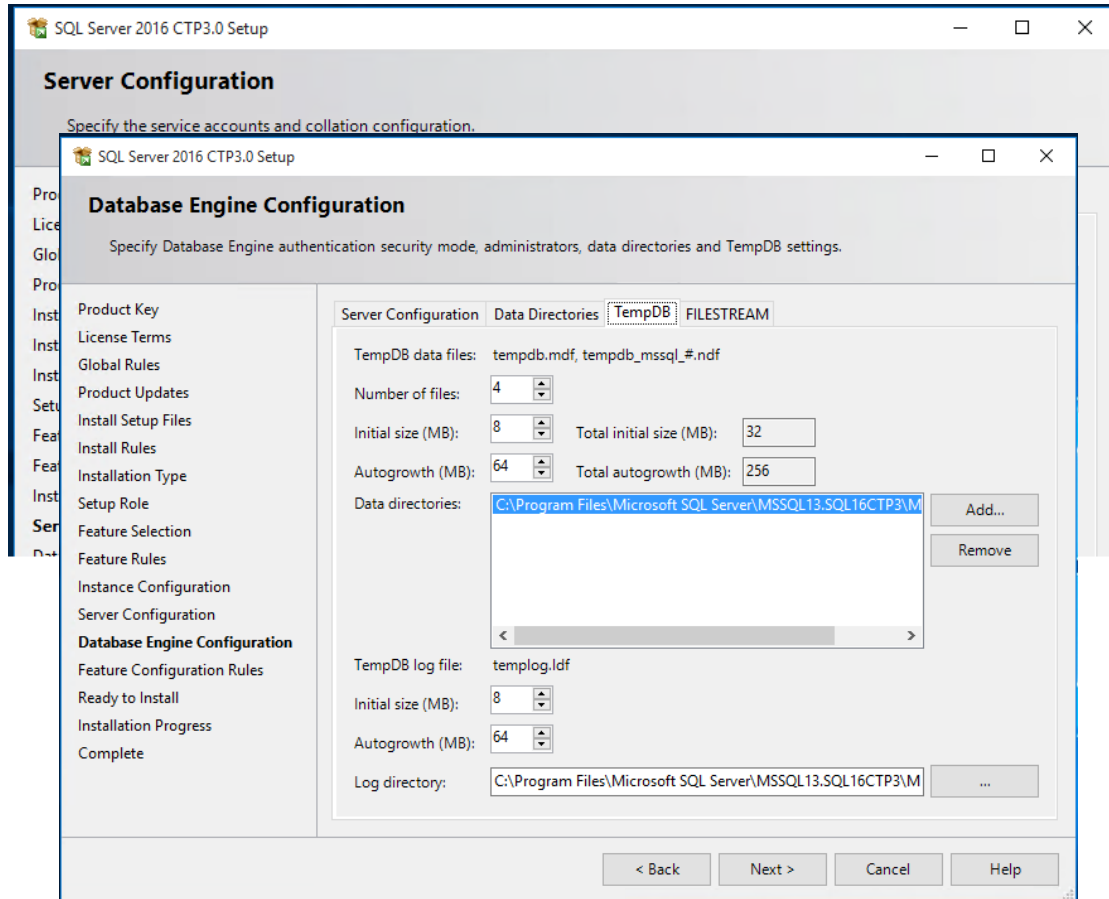
- Installation durchführen

Empfehlung => Silent Installation per cmd

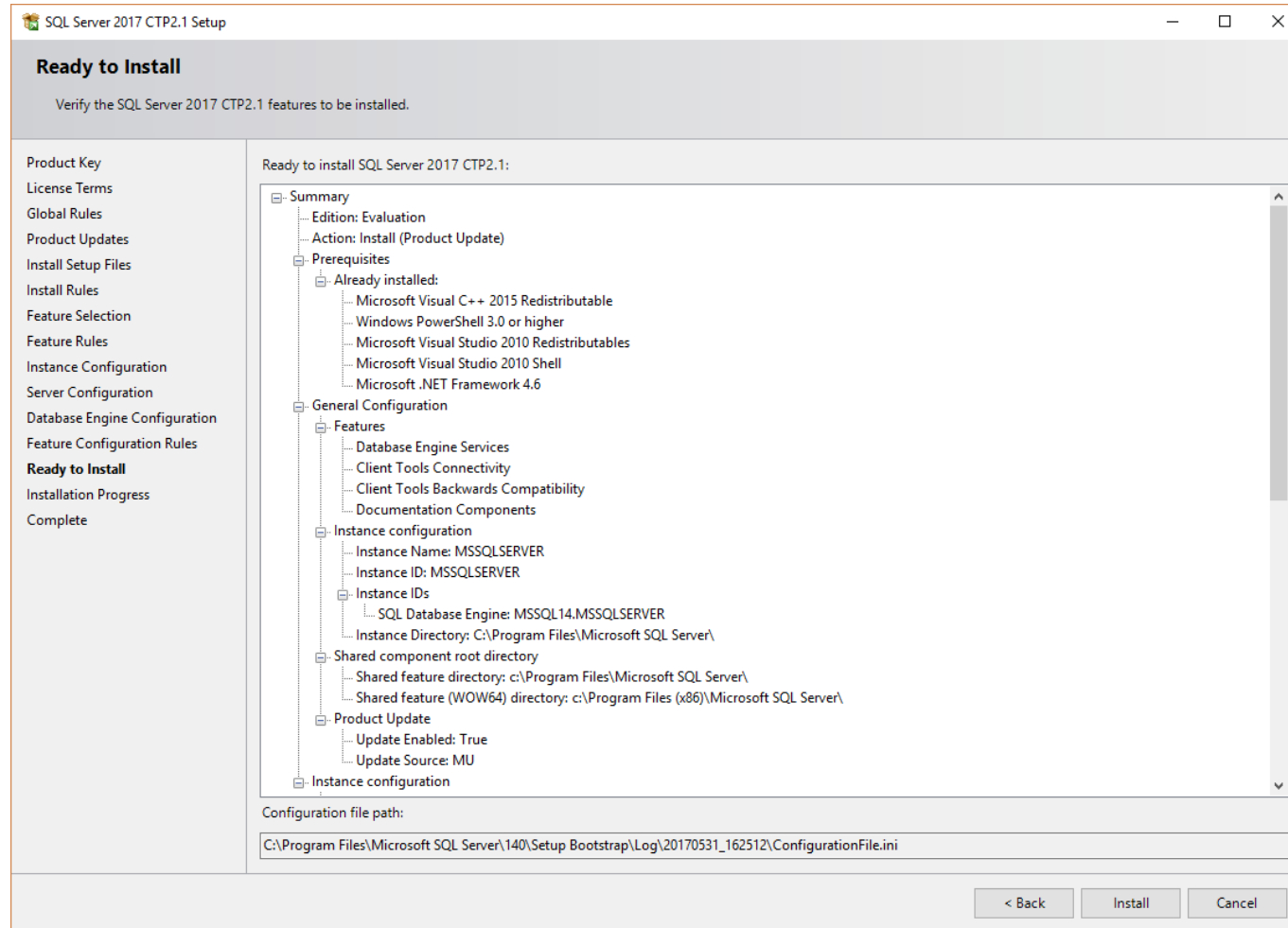
*Setup.exe /SAPWD="<SA\_PWD>" /ConfigurationFile=<TMP\_FOLDER>\ConfigurationFile.ini*



# Besonderheiten SQL Server 2016 / 2017



# Jetzt kommt das große Rühren





# Anrichten / Deko

# Konfiguration – Netzwerk

- Non Default Ports vergeben

SQL Server und SQL Agent

- Firewall Ports freigeben

TCP port

SQL Service Broker TCP

SQL Browser UDP



# Konfiguration – TempDB

- Anpassung der Anzahl der TempDB-Datafiles

If Anzahl Cores  $\leq$  8 then

Anzahl Datafiles = Anzahl Cores

else

Anzahl Datafiles = 8

alle Datafiles sollte die gleiche Größe haben

- Beispiel

TempDB-Platte hat 100GB / 4 Kerne = 4 Datenfiles mit jeweils 25GB



# Konfiguration – CPU/RAM-Nutzung

- Speicher Nutzung definieren

Sicherstellen das das OS ausreichend RAM erhält:

RAM < 8 GB, dann 1 GB für OS, 3 GB für SQL

RAM > 8 GB, dann 2 GB für OS, Rest für SQL

RAM > 64 GB, dann 4 GB für OS, Rest für SQL

RAM > 128 GB, dann 8 GB für OS, Rest für SQL

ausprobieren, anpassen, ausprobieren...

- Parameter für Adhoc-Workload aktivieren

- MaxDOP setzen

Default ist 5, normalerweise zu gering

OLTP = 40

Reporting = 25

ausprobieren, anpassen, ausprobieren...



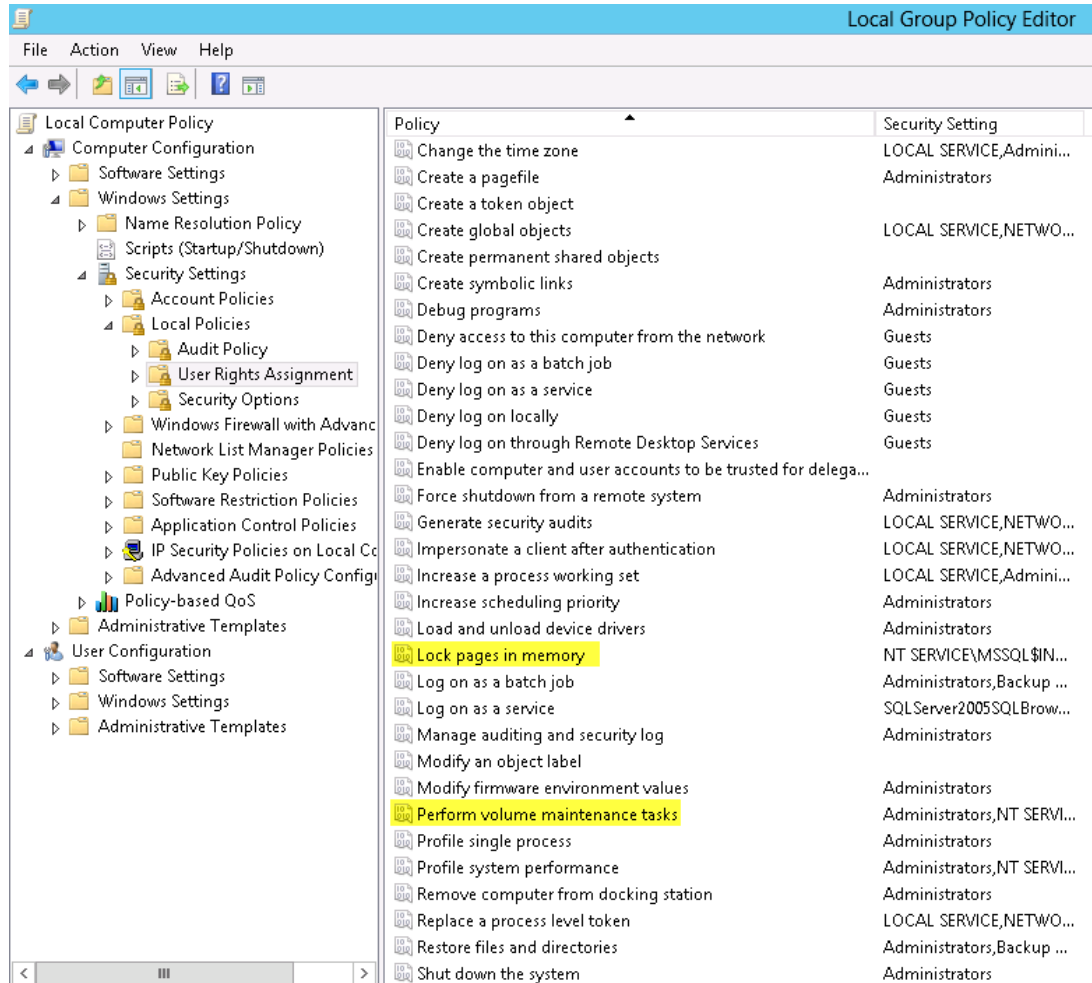


# Konfiguration – Sonstiges – 1/2

- Network packet size (8000)
- Backup compression (enable)
- sa disablen, analogen User einrichten
- SQL Server Logs konfigurieren (Cycle)
- SQL Server Audit konfigurieren (Bedarf?)(EE)
- Antivirus Software anpassen/überprüfen
- Linked Server ? COM - Berechtigungen



# Konfiguration – Sonstiges – 2/2



- Lock pages in memory

Locking pages in memory may boost performance when paging memory to disk is expected.

[http://www.sql-aus-hamburg.de/go/Lock\\_pages\\_in\\_memory](http://www.sql-aus-hamburg.de/go/Lock_pages_in_memory)

- Perform volume maintenance tasks

This security setting determines which users and groups can run maintenance tasks on a volume, such as remote defragmentation. Better now as "Enable Instant File Initialization"

[http://www.sql-aus-hamburg.de/go/Perform\\_volume\\_maintenance\\_tasks](http://www.sql-aus-hamburg.de/go/Perform_volume_maintenance_tasks)





# Housekeeping

# Magic-Maker - dbatools.io

dbatools is a free PowerShell module with over 200 SQL Server best practice, administration and migration commands included.

Introduced by Chrissy LeMaire and enriched by the community

Chrissy LeMaire, Creator, SQL DBA & Cloud and Datacenter Management (PowerShell) MVP

## Major Contributors 2017



Claudio Silva



Rob Sewell



Constantine Kokkinos



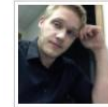
Klaas Vandenberghe



Simone Bizzotto



Shawn Melton



Mitchell Hamann



Stuart Moore



Stephen Bennett



Chris Sommer



Warren Frame



Nic Cain



Garry Bargsley



Iraklis Evangelinos



Brandon Abshire



Drew Furguele



Fred Weinmann



Enrico van de Laar



Shane O'Neill



Aaron Nelson



André Kamman



Thomas LaRock



Patrick Flynn



Jess Pomfret



John Roos

## People who have shared code that we've used



Antti Rantasaari



Adam Machanic



Amit Banerjee



Chad Miller



Donabel Santos



Jason Shirk



# Best Practice Commands

## Best Practice Commands

Expand-SqlTLogResponsibly	Set-DbaJobOwner	Test-DbaDatabaseOwner	Test-DbaServerName
Find-SqlDuplicateIndex	Set-DbaMaxDop	Test-DbaDiskAlignment	Test-DbaSpn
Find-SqlUnusedIndex	Set-DbaPowerPlan	Test-DbaDiskAllocation	Test-DbaValidLogin
Get-DbaLastBackup	Set-DbaMaxMemory	Test-DbaJobOwner	Test-DbaVirtualLogFile
Get-DbaLastGoodCheckDb	Set-SqlTempDbConfiguration	Test-DbaLastBackup	Test-SqlTempDbConfiguration
Get-DbaMaxMemory	Test-DbaMaxDop	Test-DbaMaxMemory	
Repair-DbaServerName	Test-DbaDatabaseCollation	Test-DbaOptimizeForAdHoc	
Set-DbaDatabaseOwner	Test-DbaDatabaseCompatibility	Test-DbaPowerPlan	

## Powershell

```
Set-DbaPowerplan -ComputerName SQL01
Set-DbaMaxDop -SqlServer SQL01
Set-DbaMaxMemory -SqlServer SQL01
Set-SqlTempDBConfiguration -SqlServer SQL01
```



# Beispiel - Test-SqlTempDbConfiguration

Evaluates TempDB against a set of rules to match best practices. The rules are:

- TF 1118 enabled: Is Trace Flag 1118 enabled (See KB328551)
- File Count: Does the count of data files in TempDB match the number of logical cores, up to 8.
- File Growth: Are any files set to have percentage growth, as best practice is all files have an explicit growth value.
  - File Location: Is TempDB located on the C-Drive? Best practice says to locate it elsewhere.
  - File MaxSize Set(optional): Do any files have a max size value? Max size could cause TempDB problems if it isn't allowed to grow.

Other rules can be added at a future date. If any of these rules don't match recommended values, a warning will be thrown.



# Housekeeping – Ola Hallengren

## SQL Server Backup, Integrity Check, and Index and Statistics Maintenance

The SQL Server Maintenance Solution comprises scripts for running backups, integrity checks, and index and statistics maintenance on all editions of Microsoft SQL Server 2005, SQL Server 2008, SQL Server 2008 R2, SQL Server 2012, SQL Server 2014, and SQL Server 2016.

The solution is based on stored procedures, the sqlcmd utility, and SQL Server Agent jobs.

Ola Hallengren designed the solution for the most mission-critical environments, and it is used in many [organizations](#) around the world.

The SQL Server Maintenance Solution has been voted as Best Free Tool in the [2013](#), [2012](#), [2011](#), and [2010](#) SQL Server Magazine Awards, and a top session at [PASS Summit 2014](#).

The SQL Server Maintenance Solution is [free](#).

### Telecommunications

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[TeliaSonera](#)  
[Verizon](#)

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[Thomas Cook](#)

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# Ola Hallgren - Beispiele

ADM\_CLEANUP\_BACKUPHISTORY

ADM\_OH\_CHECK\_DB\_PROD  
ADM\_OH\_CHECK\_DB\_PROD\_ONLY\_PHYSICALS  
ADM\_OH\_CHECK\_DB\_REST  
ADM\_OH\_DatabaseBackup - SYSTEM\_DATABASES - FULL  
ADM\_OH\_DatabaseBackup - USER\_DATABASES - DIFF  
ADM\_OH\_DatabaseBackup - USER\_DATABASES - FULL  
ADM\_OH\_DatabaseBackup - USER\_DATABASES - LOG  
ADM\_OH\_INDEX\_MAINTENANCE\_PROD\_Mo-Sa  
ADM\_OH\_INDEX\_MAINTENANCE\_PROD\_So  
ADM\_OH\_INDEX\_MAINTENANCE\_REST\_Mo-Sa  
ADM\_OH\_INDEX\_MAINTENANCE\_REST\_So  
ADM\_OH\_STOP\_JOB  
ADM\_OH\_UPDATE\_STATISTICS\_PROD  
ADM\_OH\_UPDATE\_STATISTICS\_REST

ADM\_REP\_DELSAMPLEID

```
EXECUTE dbo.DatabaseBackup
    @Databases = 'USER_DATABASES',
    @Directory = 'C:\Backup',
    @BackupType = 'FULL',
    @Verify = 'Y',
    @Compress = 'Y',
    @Checksum = 'Y',
    @CleanupTime = 24
```

```
EXECUTE dbo.IndexOptimize
    @Databases = 'USER_DATABASES',
    @FragmentationLow = NULL,
    @FragmentationMedium =
'INDEX_REORGANIZE,INDEX_REBUILD_ONLINE,INDEX_REBUILD_OFFLINE',
    @FragmentationHigh =
'INDEX_REBUILD_ONLINE,INDEX_REBUILD_OFFLINE',
    @FragmentationLevel1 = 5,
    @FragmentationLevel2 = 30
```





# Offene Fragen ???



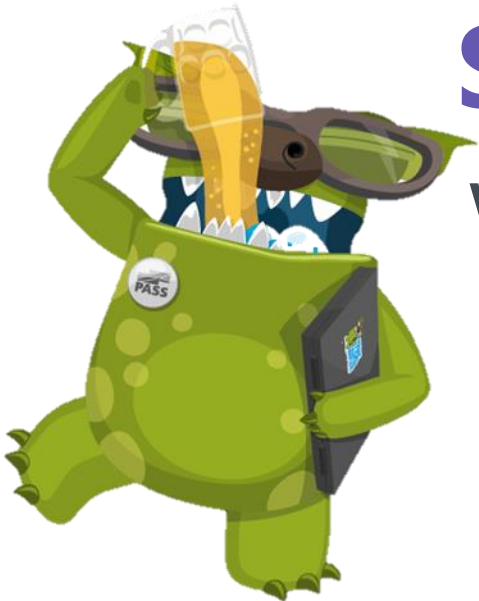
# Don't forget ... After-Show-Party!!!

## 5 Jahre SQL Saturday

an der Hochschule Bonn-Rhein-Sieg

## SQLSat Bruzzler - Grillparty

Würstchen & Bier ab ca. **19.00 Uhr**  
am Ende der Hochschulstraße



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